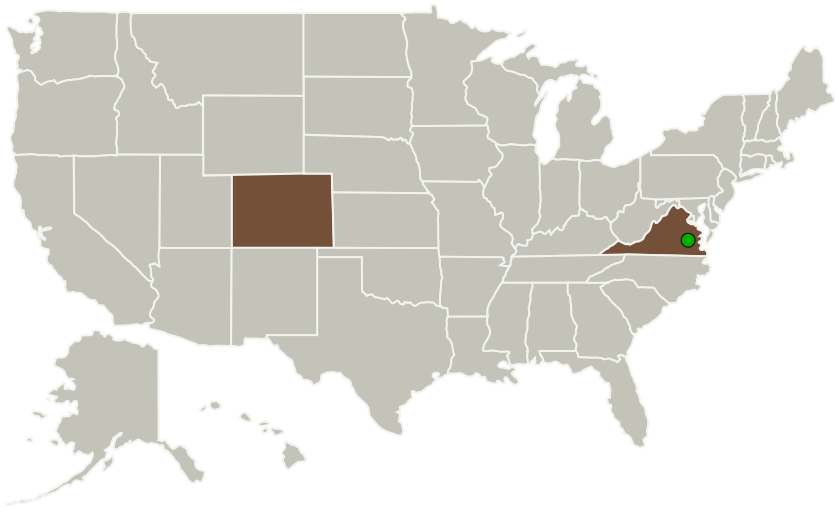
Robust, Highly Scalable Solar Array System, Phase I

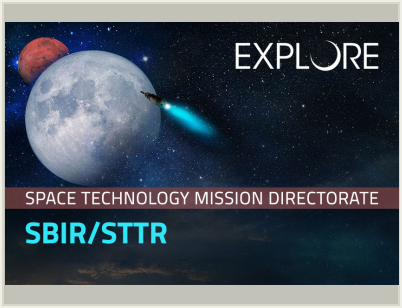
Completed Technology Project (2015 - 2015)

Project Introduction

Solar array systems currently under development are focused on near-term missions with designs optimized for the 30-50 kW power range. However, NASA has a vital interest in developing much larger solar arrays (up to 1 MW of power) for Solar Electric Propulsion (SEP) missions. Scaling to this size will require fundamental changes in many aspects of the solar array system design as embodied by NASA's Compact Telescoping Array (CTA) reference configuration. To address this emerging need for larger scale practical solar array systems, and to evolve NASA's CTA design into a design that is practical to manufacture and flight qualify, Roccor proposes the mega-watt-class ROC-Array. The ROC-Array is a CTA-derivative design that yields improved packaged volume and deployed frequency through a tension-stiffened hierarchical structure. Exploiting structural hierarchy through the use of tension guy wire elements and next-generation deployable boom systems will afford an improved packaging efficiency, increased stiffness, and reduced mass. Performance enhancements will be achieved by replacing the solid wall telescoping mast in the CTA reference design with a deployable tension-stiffened boom structure.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Roccor, LLC	Lead Organization	Industry	Longmont, Colorado
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Colorado	Virginia

Project Transitions

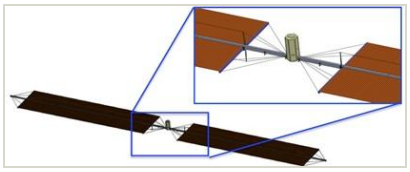
June 2015: Project Start

December 2015: Closed out

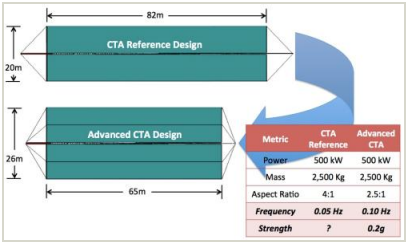
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139419)*

Images



Briefing Chart
Robust, Highly Scalable Solar Array System Briefing Chart *(https://techport.nasa.gov/image/132213)*



Final Summary Chart Image
Robust, Highly Scalable Solar Array System, Phase I Project Image *(https://techport.nasa.gov/image/128726)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Roccor, LLC

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

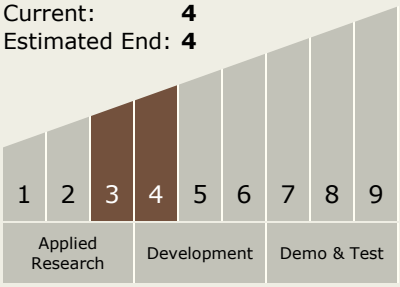
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Mark S Lake

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.2 Structures
    - TX12.2.1 Lightweight Concepts

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System